

CLAIMS

What is claimed is:

5 1. An engraving toolholder comprising:

a cylindrical body configured to be held in a collet or
endmill toolholder of an engraving machine;

10 a mechanism for holding a toolbit, the toolbit holding
mechanism comprising a collet configured to clamp a toolbit
therein; and

15 a mechanism for biasing the toolbit holding mechanism in a
direction toward a workpiece when the cylindrical body is held in
the engraving machine, the biasing mechanism configured to apply a
pressure in response to variations in a surface of the workpiece
with respect to the engraving machine to produce an even engraving
mark on the workpiece.

2. The engraving toolholder of claim 1, wherein:

20 the cylindrical body comprises a main body having a bore
extending axially through at least portions of the main body, the
bore having an open front end; and

25 the toolbit holding mechanism comprises a toolbit holder
assembly disposed for longitudinal reciprocal translation in the
bore of the main body; and

the biasing mechanism comprises a compressible element
disposed within the bore of the main body, a back end of the
compressible element abutting against a surface at a rear portion
of the main body, a front end of the compressible element abutting
against the toolbit holder assembly.

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3. The engraving toolholder of claim 2, wherein the toolbit
holding assembly comprises a collet holder and a collet configured

to retain a toolholder therein, the collet retained in the collet holder.

4. The engraving toolholder of claim 2, further comprising one or more retaining elements travelable along one or more cooperative longitudinal guides, the retaining elements and cooperative longitudinal guides disposed between the main body and the toolbit holder assembly to provide the longitudinal reciprocal translation of the toolbit holder assembly with respect to the main body.

5. The engraving toolholder of claim 1, wherein:

the toolbit holding mechanism comprises a cylindrical body having a front bore section and a rear bore section extending axially therethrough, an abutment section separating the front bore section and the rear bore section, and a toolbit holder assembly configured to fixedly retain a toolbit in the front bore section of the main body;

the biasing mechanism comprises:

20 a retaining member disposed for longitudinal reciprocal translation in the rear bore section of the cylindrical body, the retaining member restrained from rotation within the rear bore section, and

25 a compressible element disposed between the abutment section and the retaining member to apply a biasing force to the cylindrical body in a direction toward a workpiece when the engraving toolholder is held in an engraving machine; and

30 the cylindrical body comprises a portion of the retaining member extending from a rear opening of the rear bore section and configured to be held in a collet or endmill toolholder of an engraving machine.

6. The engraving toolholder of claim 5, wherein the toolbit holder assembly comprises a collet configured to retain a toolbit therein, the collet at least partially disposed in the front bore section, and a collet nut fastened to a front end of the main body
5 to retain the collet in the front bore section.

7. The engraving toolholder of claim 5, further comprising one or more retaining elements in the rear bore section of the main body travelable along one or more cooperative longitudinal guides,
10 the retaining elements and cooperative longitudinal guides disposed between the main body and the retaining member to provide the longitudinal reciprocal translation of the main body with respect to the retaining member.

15 8. The engraving toolholder of claim 5, wherein the retaining member has a central opening therethrough.

9. An engraving toolholder comprising:
a main body configured to be held in a collet or endmill
20 toolholder of an engraving machine;
the main body having a bore extending axially through at least a portion of the main body, the bore having an open front end;
a toolbit holder assembly disposed within the bore of the
25 main body;
the toolbit holder assembly disposed for longitudinal reciprocal translation along an axis of the main body;
the toolbit holder assembly retained within the main body;
the toolbit holder assembly restrained from rotation within
30 the main body; and
a biasing mechanism disposed to bias the toolbit holder assembly toward a workpiece in the direction of the open front end.

10. The engraving toolholder of claim 9, wherein the biasing mechanism comprises a compressible element disposed within the bore of the main body, a back end of the compressible element
5 abutting against a surface at a rear portion of the main body, a front end of the compressible element abutting against the toolbit holder assembly.

11. The engraving toolholder of claim 9, wherein the biasing mechanism comprises a spring disposed within the bore of the main body, a back end of the spring abutting against a surface at a rear portion of the main body, a front end of the spring abutting against the toolbit holder assembly.

15 12. The engraving toolholder of claim 11, further comprising a retaining screw disposed within the rear portion of the main body, the retaining screw providing the surface abutting against the back end of the spring.

20 13. The engraving toolholder of claim 12, wherein the retaining screw has a central opening therethrough.

14. The engraving toolholder of claim 9, wherein the toolbit holder assembly comprises:
25 a collet holder disposed for longitudinal reciprocal translation in the main body, the collet holder having a toolbit end;
a collet configured to retain a toolbit therein, the collet disposed within the toolbit end of the collet holder; and
30 a collet nut fastened to the toolbit end of the collet holder to retain the collet therein.

15. The engraving toolholder of claim 14, wherein the collet nut is threadably engaged on the end of the collet holder.

16. The engraving toolholder of claim 14, wherein the collet is
5 configured to releasably retain the toolbit therein.

17. The engraving toolholder of claim 14, wherein the collet holder includes one or more retaining elements disposed to extend from an outer surface thereof, the one or more retaining elements
10 cooperatively received in one or more longitudinal guides formed on an inner surface of the main body, whereby the one or more retaining elements guide travel of the collet holder along the axis of the main body.

15 18. The engraving toolholder of claim 17, wherein the one or more retaining elements comprise ball bearings rollably received in apertures in the collet holder, and the one or more longitudinal guides comprise longitudinal slots.

20 19. The engraving toolholder of claim 18, wherein the one or more retaining elements comprise protrusions formed to extend from the outer surface of the collet holder, and the one or more longitudinal guides comprise longitudinal slots.

25 20. The engraving toolholder of claim 19, wherein the one or more longitudinal guides extend along a portion of the inner surface of the main body.

21. The engraving toolholder of claim 17, wherein the one or
30 more retaining elements comprise longitudinal grooves formed in the outer surface of the collet holder, and the one or more longitudinal guides comprise correspondingly-shaped grooves formed in the inner surface of the main body.

22. The engraving toolholder of claim 21, wherein the grooves are square-shaped in cross-section.

5 23. The engraving toolholder of claim 17, wherein the one or more longitudinal guides extend substantially the length of the main body.

10 24. The engraving toolholder of claim 17 wherein the one or more retaining elements and the one or more longitudinal guides comprise complementary splines.

15 25. The engraving toolholder of claim 14, wherein each of the collet holder and the collet nut has a hexagonal outer configuration.

26. The engraving toolholder of claim 14, wherein each of the collet nut and the end cap has a cylindrical outer configuration and a wrench flat formed on a portion of the outer surface.

20 27. The engraving toolholder of claim 14, wherein each of the collet holder, the collet nut, and the end cap has a wrench flat formed on a portion of an outer surface thereof.

25 28. The engraving toolholder of claim 9, further comprising one or more retaining elements travelable along one or more cooperative longitudinal guides, the retaining elements and cooperative longitudinal guides disposed between the main body and the toolbit holder assembly to provide the longitudinal reciprocal 30 translation of the toolbit holder assembly with respect to the main body.

29. The engraving toolholder of claim 9, further comprising a retaining mechanism disposed to retain the toolbit holder assembly within the bore of the main body.

5 30. The engraving toolholder of claim 29, wherein the retaining mechanism comprises an end cap securable over the front end of the main body, the end cap including an annular shoulder directed radially inwardly, the toolbit holder assembly including retaining elements disposed to abut against the shoulder of the end cap.

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31. The engraving toolholder of claim 29, wherein the retaining mechanism comprises an annular shoulder directed radially inwardly at the front end of the main body, the toolbit holder assembly including retaining elements disposed to abut against the shoulder of the end cap.

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32. The engraving toolholder of claim 9, further comprising a rotational restraining mechanism disposed to restrain the toolbit holder assembly from rotation within the main body.

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33. The engraving toolholder of claim 32, wherein the rotational restraining mechanism comprises one or more retaining elements disposed to extend from an outer surface of the toolbit holder assembly, the one or more retaining elements cooperatively received in one or more longitudinal guides formed on an inner surface of the main body, whereby the one or more retaining elements guide travel of the toolbit holder assembly along the axis of the main body.

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34. The engraving toolholder of claim 33, wherein the one or more retaining elements comprise ball bearings rollably received in apertures in the toolbit holder assembly, and the one or more longitudinal guides comprise longitudinal slots.

35. The engraving toolholder of claim 33, wherein the one or more retaining elements comprise protrusions formed to extend from the outer surface of the toolbit holder assembly, and the one or 5 more longitudinal guides comprise longitudinal slots.

36. The engraving toolholder of claim 33, wherein the one or more longitudinal guides extend along a portion of the inner surface of the main body.

10 37. The engraving toolholder of claim 33, wherein the one or more retaining elements comprise longitudinal grooves formed in the outer surface of the toolbit holder assembly, and the one or more longitudinal guides comprise correspondingly-shaped grooves 15 formed in the inner surface of the main body.

38. The engraving toolholder of claim 37, wherein the grooves are square-shaped in cross-section.

20 39. The engraving toolholder of claim 33, wherein the one or more longitudinal guides extend substantially the length of the main body.

25 40. The engraving toolholder of claim 33, wherein the one or more retaining elements and the one or more longitudinal guides comprise complementary splines.

41. The engraving toolholder of claim 9, wherein the toolbit holder assembly comprises:

30 a toolholder having an aperture therein sized to receive a toolbit;
a fastening element configured to retain the toolbit in the aperture; and

an end cap engageable with the front end of the main body to retain the toolholder within the main body.

42. The engraving toolholder of claim 41, wherein the fastening 5 element comprises a set screw.

43. The engraving toolholder of claim 9, further comprising a retaining screw disposed within a rear portion of the main body and having a shaft extension protruding from the back end of the 10 main body, the shaft extension having an outer diameter configured to be received in an engraving machine.

44. The engraving toolholder of claim 43, wherein the outer diameter of the shaft extension is less than an outer diameter of 15 the main body.

45. The engraving toolholder of claim 9, wherein the main body has a cylindrical outer configuration.

20 46. An engraving toolholder comprising:
an elongated main body having a front bore section and a rear bore section extending axially therethrough, an abutment section separating the front bore section and the rear bore section;

25 a toolbit holder assembly configured to fixedly retain a toolbit in the front bore section of the main body; and
a biasing mechanism disposed in the rear bore section, the biasing mechanism comprising:

30 a retaining member disposed for longitudinal reciprocal translation in the rear bore section, the retaining member restrained from rotation within the rear bore section, a portion of the retaining member extending from a rear opening of the rear bore section and configured to be held

in a collet or endmill toolholder of an engraving machine,
and

5 a compressible element disposed between the abutment
wall and the retaining member to apply a biasing force on
the main body in a direction toward a workpiece when the
engraving toolholder is held in an engraving machine.

10 47. The engraving toolholder of claim 46, wherein the toolbit
holder assembly comprises a collet configured to retain a toolbit
therein, the collet at least partially disposed in the front bore
section, and a collet nut fastened to a front end of the main body
to retain the collet in the front bore section.

15 48. The engraving toolholder of claim 47, wherein the collet nut
is threadably engaged on the front end of the main body.

49. The engraving toolholder of claim 47, wherein the collet is
configured to releasably retain the toolbit therein.

20 50. The engraving toolholder of claim 46, further comprising one
or more retaining elements in the rear bore section of the main
body travelable along one or more cooperative longitudinal guides,
the retaining elements and cooperative longitudinal guides
disposed between the main body and the retaining member to provide
25 the longitudinal reciprocal translation of the main body with
respect to the retaining member.

30 51. The engraving toolholder of claim 50, wherein the retaining
elements comprise ball bearings disposed in apertures in the rear
bore section and the longitudinal guides comprise slots in the
retaining member.

52. The engraving toolholder of claim 46, wherein the retaining member further includes a shoulder disposed to prevent removal of the retaining member from the rear bore section.

5 53. An engraving toolholder comprising:

a cylindrical body configured to be held in a collet or endmill toolholder of an engraving machine;

means for holding a toolbit, the toolbit holding means comprising a collet configured to clamp a toolbit therein; and

10 means for biasing the toolbit holding means in a direction toward a workpiece when the cylindrical body is held in the engraving machine, the biasing means configured to apply a pressure in response to variations in a surface of the workpiece with respect to the engraving machine to produce an even engraving

15 mark on the workpiece.

54. The engraving toolholder of claim 53, wherein:

the cylindrical body comprises a main body having a bore extending axially through at least a portion of the main body, the bore having an open front end; and

the toolbit holding means comprises a toolbit holder assembly disposed for longitudinal reciprocal translation in the bore of the main body; and

25 the biasing means comprises a compressible element disposed within the bore of the main body, a back end of the compressible element abutting against a surface at a rear portion of the main body, a front end of the compressible element abutting against the toolbit holder assembly.

30 55. The engraving toolholder of claim 54, wherein the toolbit holding assembly comprises a collet holder and a collet configured to retain a toolholder therein, the collet retained in the collet holder.

56. The engraving toolholder of claim 54, further comprising one or more retaining elements travelable along one or more cooperative longitudinal guides, the retaining elements and
5 cooperative longitudinal guides disposed between the main body and the toolbit holder assembly to provide the longitudinal reciprocal translation of the toolbit holder assembly with respect to the main body.

10 57. The engraving toolholder of claim 53, wherein:

the toolbit holding means comprises a cylindrical body having a front bore section and a rear bore section extending axially therethrough, an abutment section between the front bore section and the rear bore section, and a toolbit holder assembly
15 configured to fixedly retain a toolbit in the front bore section of the main body;

the biasing means comprises:

20 a retaining member disposed for longitudinal reciprocal translation in the rear bore section of the cylindrical body, the retaining member restrained from rotation within the rear bore section, and

25 a compressible element disposed between the abutment section and the retaining member to apply a biasing force to the cylindrical body in a direction toward a workpiece when the engraving toolholder is held in an engraving machine; and

the cylindrical body comprises a portion of the retaining member extending from a rear opening of the rear bore section and configured to be held in a collet or endmill toolholder of an engraving machine.

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58. The engraving toolholder of claim 57, wherein the toolbit holder assembly comprises a collet configured to retain a toolbit therein, the collet at least partially disposed in the front bore

section, and a collet nut fastened to a front end of the main body to retain the collet in the front bore section.

59. The engraving toolholder of claim 57, further comprising one
5 or more retaining elements in the rear bore section of the main
body travelable along one or more cooperative longitudinal guides,
the retaining elements and cooperative longitudinal guides
disposed between the main body and the retaining member to provide
the longitudinal reciprocal translation of the main body with
10 respect to the retaining member.

60. The engraving toolholder of claim 57, wherein the retaining
member has a central opening therethrough.